



Conference Abstract

# Cryogenic pretreatment of keratinous waste for enhanced methane production

Elena Kuzmanova<sup>‡</sup>, Joseph C. Akunna<sup>‡</sup>, Nikolai Zhelev<sup>‡</sup>

<sup>‡</sup> Abertay University, Dundee, United Kingdom

Corresponding author: Elena Kuzmanova ([e.kuzmanova@abertay.ac.uk](mailto:e.kuzmanova@abertay.ac.uk))

Received: 12 Jun 2017 | Published: 05 Jul 2017

Citation: Kuzmanova E, Akunna J, Zhelev N (2017) Cryogenic pretreatment of keratinous waste for enhanced methane production. BioDiscovery 20: e14096. <https://doi.org/10.3897/biodiscovery.20.e14096>

## Abstract

Significant amount of keratinous waste is generated every year, derived from various sources. The structure and complexity of a wool fibre as such, provides resistance and challenge for bacteria to degrade into compounds that can be metabolised. That is why cryogenic pretreatment was applied to improve the digestibility of four sheep breeds fibres. In addition to structural and molecular differences between the untreated, raw wool and treated samples, the effect of pretreatment on methane production for these raw fibres was investigated by anaerobic batch digestion at 37°C. As a response of cryogenic application, soluble protein content had increased in each pretreated sample in comparison with untreated samples, whereas the molecular structure of wool fibres remains intact. The degradation is additionally facilitated by structural changes in the morphological structure. Furthermore, treatment resulted in increased methane production for all treated wool fibres.

## Keywords

cryogenic pretreatment, wool, methane production, molecular structure, morphology

## **Presented at**

World BioDiscovery Congress 2017